

**RAIL-TO-RAIL AMPLIFIER FOR USE IN LINE-INVERSION  
GRAYSCALE REFERENCE GENERATOR**

ABSTRACT OF THE DISCLOSURE

A rail-to-rail amplifier suitable for use in a line-inversion LCD grayscale reference generator comprises a p-type differential pair and a first switchable current source which supplies tail current to the p-type pair in response to a first control signal, and an n-type pair and a second switchable current source which supplies tail current to the n-type pair in response to a second control signal; when its tail current is present, each pair provides a differential output current which varies with a differential input signal. A control circuit provides the control signals such that the first switchable current source is enabled when a voltage applied to the amplifier's input is closer to the amplifier's negative supply rail, and the second switchable current source is enabled when the applied voltage is closer to the amplifier's positive supply rail, such that only one input pair is active at any given time.